Comments on the draft California Bioenergy Action Plan

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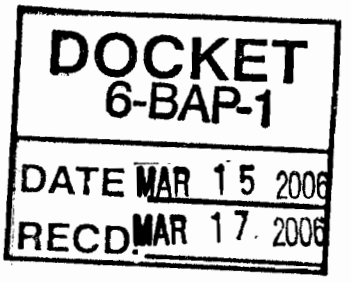

March 15, 2006

1. Biofuel crops:

Comment: *The crops used as reference for ethanol and biodiesel production in CA are not the ones likely to be of greatest value in a biofuels program in the state.*

Oilseeds are mentioned as a source of biodiesel. The report mentions soybeans on several occasions but soybeans have never been produced commercially for oil in CA. They are better adapted to the mid-west. In CA they tend to shatter, drop seeds, set fewer seeds than in more conducive climates and are subject to losses due to insects-spider mites in particular. An adapted oilseed is safflower, which is widely grown. It is essentially pest free and can be grown on winter rainfall in the Sacramento Valley and with moderate irrigation in the San Joaquin Valley. The oleic acid type is thought to be particularly suitable for use as biodiesel. Canola or other oilseed rape also will grow in CA though at present it does not have much commercial application. It can be grown like winter wheat and rely in many locations on winter rainfall. Weed control is more difficult and there are some insect pests, particularly aphids, but is should be adaptable to CA. Both safflower and canola are moderately salt-tolerant, so municipal waste water or saline waste water can be used in their production.

Grains are mentioned as a source of ethanol. Corn is the most commonly used source of ethanol in California, but barley and wheat grow well here, are produced during winter on winter rainfall and stored soil moisture, and are salt-tolerant. The straw is easily harvested and may be a source of cellulosic biomass. Apart from diseases like stripe rust, which are controlled primarily through plant breeding programs, they are pest free.

Sugarbeets, which grow well in California, may also be a viable energy crop. Yields in California are the highest in the world, by-products are dried using solar energy compared to the use of fossil fuel elsewhere, and they can be grown at high yield levels on soils marginal for other crops and with the use of waste waters.

The agronomic research and outreach needed to support crop production for biofuels has been or

could be done by the University of California's agricultural scientists and extension advisors and should be an explicit part of any future biofuels research and development program.

2. Agricultural residues:

Comment: *Calculations of available biomass from agricultural systems are preliminary and will likely need further supporting long-term experimental work to refine sustainable crop residue removal levels that account for increased recycling for the storage of C in soils and the use of higher residue levels for reduced tillage practices.*

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Calculations of biomass availability were made with consideration of the effects of returning carbon containing residues to the soils, or their use to reduce winter runoff, improve water infiltration into soils, or for weed control, but the values are preliminary. Particularly the addition or removal of crop residues can have long-term effects on soil quality and productivity over time, and may have secondary, more complex effects on soil ecosystems and plant health. These are difficult to study but must be taken into account, both through modeling, but equally importantly, through empirical research. The College of Agriculture and natural Resources at UC Davis maintains the only field scale research project focused on the long-term effects of critical management practices in arable farming systems in California. Long-term research is the only way to develop the bio-physical data needed to assess trends in important properties of agricultural systems. Research, as opposed to modeling, allows for unanticipated phenomena to emerge over time and be understood. This project, called LTRAS (Long Term Research on Arable Farming Systems, www.ltras.ucdavis.edu) is the College's research facility for evaluating such questions and will prove useful in a long term biofuels program in the state.

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3. Biofuels cropping systems.

Comment: *Consider using waste water and recycled waste materials in biofuel production systems on lower quality soils.*

For crops to be practical and useful for biofuels, either for ethanol/biodiesel or as cellulosic sources, the cost of production must remain low. This may be achieved through intensive, high yielding but efficient crop production practices, often linked to high quality soil and water resources. An alternative strategy is to use lower quality soils, recycled waste materials for fertilizer and waste waters from diverse sources to produce crops and forages for biomass. There are some models of this practice already underway in California, including research in Kings County with well quantified soil and crop production data being conducted by a consortium of researchers including the University of California and the USDA/ARS. By serving multiple public functions, systems with a combination of acceptable crop yields and credits for recycling of waste resources in the public interest may provide a large amount of biomass for biofuel production. Such production systems, and the use of poorer quality soil and water resources is agronomically challenging, will require careful monitoring where attempted, and would benefit from the establishment of systems-style research projects.

Kaffka, CA. Bioenergy Action

4. Farm land preservation

Comment: *Farmland preservation, especially in the Sacramento and San Joaquin Valleys is essential for California to develop a substantial, state-based biofuels program.*

5.. Regulatory inhibition of biofuel production.

Comment: *There are a number of regulations or potential regulations that may interfere with a the development of a biofuels program in California. The state needs a process to evaluate where such interests conflict and a rational process to resolve them. Currently, it appears that state agencies set regulations in their area of competence without regard to the larger implications of such regulations on production systems. The current interagency process should be broadened to include experts from the University in areas like agronomy, soil and water science, and pest management, and cropping systems.*

For example, regulation of the dairy industry resulting in the loss of current operations or the restriction of future ones will directly affect the capacity of ethanol and biodiesel producers to find economic outlets for their distillers grains left over from fermentation of grain for ethanol, and their oilseed meals left over from biodiesel production. Currently, these materials are an efficient and cost effective feed source for dairy cows and beef producers. Without these cattle, the by-products of energy production may become a waste disposal problem.

For water recycling to occur, water quality regulations of various sorts may need to accommodate the benefits from a biofuels program with current or future standards. In particular, regulations concerning the reuse of waste waters from food processing facilities, saline drainage water management may restrict the use of these materials for biofuel production. There are many other examples. Scientists having familiarity with crop production systems in California would be able to help identify such current or potential constraints and evaluate their impact.